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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,200	10/02/2003	Akira Fukumoto	10873.1303US01	2135
23552	7590	11/04/2004	EXAMINER	
MERCHANT & GOULD PC P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903			ROCCHIGLIANI, RENZO	
			ART UNIT	PAPER NUMBER
			2825	

DATE MAILED: 11/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

ix

Office Action Summary	Application No. 10/678,200	Applicant(s) FUKUMOTO, AKIRA	
	Examiner Renzo N. Rocchegiani	Art Unit 2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2, 4-5, 10-11, 13, 15-16 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,627,549 B2 (Juengling).

Juengling discloses a semiconductor device and method to form the same wherein the device comprises conductive film wirings or patterns with protrusions formed at the corners and end part of the wiring or patterns wherein the protrusions face a clearance between the wirings. (See Fig. 16) The protrusions protrude outward from the corner. (Fig. 16) The conductive films form T-shaped grooves wherein the protrusions are formed at the corners of the conductive films forming the T-shaped grooves. (Fig. 12) Some of the conductive wirings are formed parallel to each other and comprise protrusions at the end thereof and protrusions that extend toward each other. (Fig. 15 and 16) Furthermore, Juengling discloses the formation of a dielectric material on and between the conductive film patterns and wirings. (item 16).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,627,549 B2 (Juengling) in view of U.S. Patent No. 5,846,874 (Hartranft et al.).

As stated in paragraph 2, all the limitations of these claims have been met except for teaching that some protrusions bridge inward corner portions.

Hartranft et al. teach that in an integrated circuit layout, the inner corners may be bridged with a protrusion. (Fig. 6).

It would have been obvious to one with ordinary skill in the specific art to bridge a corner with a protrusion, since doing so would prevent shear stress damage to the chip. (See Hartranft et al., col. 1, lines 62-67).

5. Claims 6-8 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,627,549 B2 (Juengling) in view of U.S. Patent No. 6,653,717 B2 (Jain et al.).

As stated in paragraph 2, all the limitations of the claims have been met except for teaching that there are provided bonding pads also coated with dielectric material wherein the bonding pads are formed with the same film that constitutes the conductive wirings and patterns.

Jain et al. teaches a semiconductor device with conductive wirings and patterns comprising some protrusions (Fig. 11) wherein the contact pads (item 58) are formed of the same film material as the wiring and pattern structures and wherein the contact pads are also covered with dielectric material. (Fig. 12 and 13).

It would have been obvious to one with ordinary skill in the art to form contact pads and to form them with the same films, since both Juengling and Jain et al. teach how to form integrated circuit devices and contact pads are necessary structures for the integrated circuit devices to function.

6. Claims 9 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,627,549 B2 (Juengling).

As stated in paragraph 2, all the limitations of these claims have been met except for specifying the size of the protrusions.

While Juengling does not specify the size of the protrusion, it would be obvious to one with ordinary skill in the specific art to arrive at the claimed sizes, since a change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,627,549 B2 (Juengling) in view of U.S. Patent No. 6,653,717 B2 (Jain et al.) and in further view of U.S. Patent Application Publication No. 2004/0056351 A1 (Wu et al.).

As stated in paragraph 2, all the limitations of this claim have been met except for

teaching that there are provided bonding pads also coated with dielectric material wherein the contacts to the bonding pads are formed by patterning a photosensitive resin film on the insulating film and using the patterned photosensitive film as a mask to pattern the insulating film.

Jain et al. teaches a semiconductor device with conductive wirings and patterns comprising some protrusions (Fig. 11) wherein the contact pads (item 58) are formed of the same film material as the wiring and pattern structures and wherein the contact pads are also covered with dielectric material. (Fig. 12 and 13).

Wu et al. teaches the formation of a semiconductor device wherein patterns through a dielectric layer to form contacts are created by by patterning a photosensitive resin film on the insulating film and using the patterned photosensitive film as a mask to pattern the insulating film. ([0033]).

It would have been obvious to one with ordinary skill in the specific art to combine the teachings of Wu et al. to those of Juengling and Jain et al., since both Juengling and Jain et al. teach how to form integrated circuit devices and contact pads are necessary structures for the integrated circuit devices to function, and since Wu et al. accomplishes the formation of the contact by teaching that either a photosensitive resin mask or a photoresist mask may be used. ([0033]).

Response to Arguments

8. Applicant's arguments filed August 9, 2004 have been fully considered but they are not persuasive. Applicant sets forth four main arguments as to why the prior art

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does not anticipate nor render the presently claimed invention obvious. The examiner disagrees with each point and addresses them in order in the following paragraphs.

Applicant is incorrect in stating that the Juengling reference does not disclose wiring with corners. The Juengling reference discloses wiring patterns. These patterns are mostly rectangular in shape. Thus, most of the wiring include a minimum of four corners. Thus, applicant's argument that the prior art does not teach wiring with corners is not persuasive.

Secondly, applicant is also incorrect in stating that Juengling does not disclose forming a protrusion at the corner of the wiring structures. Looking for example at Fig. 16, the examiner does not understand how item 630 is not at a corner. Furthermore, items 632 clearly extends over the corner ends of item 620. Thus, Juengling does teach forming protrusions at the corner of the wiring patterns. The same is true when looking at figure 12 of the Juengling reference, in that figure item 230 extends from an end corner of structure 200.

Thirdly, the protrusion on structure 620 of Fig. 16 of Juengling extent to a side of structure 610. Just like applicant has admitted in his arguments that the bottom side of item 620 is parallel with the upper side of item 610, so are the left side of item 620 and the right side of item 610. Thus, the protrusion are located as required by the claim language.

Finally, applicant argues that Fig. 15 of the Juengling reference does not teach a protrusion because what extends outward is not smaller than the surface from which it extends. Nothing in the claim language requires this. Figure 15 shows a protrusion

thus the limitation is met. If applicant would like to limit the protrusion to only mean a small extension then applicant is invited to amend the claims to so recite.

For the foregoing reasons the examiner believes the rejection to be proper and to cover the claims even as amended. Thus the rejection stands as previously presented.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renzo N. Rocchegiani whose telephone number is (571)272-1904. The examiner can normally be reached on Mon.-Fri. 8:00 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (571)272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Renzo N. Rocchegiani
Examiner
Art Unit 2825

A handwritten signature in black ink, appearing to read "Matthew Smith", with a stylized, cursive script.

MATTHEW SMITH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800